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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,430	07/10/2006	Peter Glanville Chapman	HAC-044	9320

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EXAMINER	
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ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,430	CHAPMAN ET AL.	
	Examiner	Art Unit	
	YANA BELYAEV	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 19-47 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 19, 27, and 32 refer to "a first mode" and a "second mode." The Applicant's original disclosure makes no mention of modes. The Applicant is asked to cite the part of the original disclosure which makes reference to modes.

3. The term "compensatory" in claims 27, 32, and 34 is a relative term which renders the claim indefinite. The term "compensatory " is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 19-26 and 41-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Patent Publication WO 97/06940 (Chapman hereinafter) in view of US Patent 7,335,010 (Ulrich hereinafter).

Regarding claim 19, Chapman discloses a continuous process for producing oriented plastic tube (abstract), comprising:

Extruding a plastic tube (page 1, line 19) and passing the plastic through the diameter calibrator (page 3, line 29 and Figure 1, element 13), wherein the plastic tube passing through the diameter calibrator has a tube outside diameter (page 3, lines 26-27).

Chapman further discloses that the extrusion of the plastic tube occurs prior to temperature conditioning (page 3, line 33), diametrically expanding (page 3, lines 36-37), and cooling to produce the oriented plastic tube (page 6, line 4).

Chapman does not explicitly state that the diameter calibrator controls a circumferential draw ratio of said oriented tube produced. However, the applicant defines the circumferential draw ratio as being the ratio of the final pipe mid-wall circumference to the mid-wall circumference of the extruded tube (page 1, paragraph 7). The diameter calibrator sets the diameter of the extruded tube, thus it inherently controls the circumferential draw ratio of the oriented tube produced.

While Chapman does disclose a diameter calibrator (page 3, line 29 and Figure 1, element 13), Chapman does not disclose a variable diameter calibrator.

However, Ulrich, discloses a variable diameter calibrator (column 3, lines 46-49).

It would have been obvious for one of ordinary skill in the art at the time of the invention to have substituted the calibrator, disclosed by Chapman, for the variable diameter calibrator, disclosed by Ulrich. The motivation to do so would have been the rationale that by using the variable diameter calibrator, diameter changes can be automatically made without interrupting production (column 3, lines 38-43).

Regarding claims 20-22, Chapman discloses that the diametrical expansion step comprises application of an internal pressure, specifically an expandable plug with maintains pressure within the expansion zone (page 5, lines 22-24 and Figure 1, element 26), wherein element 20, Figure 1 represents the expansion zone.

Chapman further discloses that the internal pressure is limited at an upstream end by an upstream plug (page 4, lines 10-12), wherein the examiner takes the position that the pushing of the tube tightly onto the upstream plug, a seal is created which maintains the pressure in the expansion zone, thereby the upstream plug limits the internal pressure at the upstream end.

Regarding claims 23- 24, Chapman discloses the step of adjusting the extruded tube initial wall thickness, so as to alter the wall thickness of the oriented tube produced by the continuous process (page 4, lines 20-24).

Chapman does not explicitly disclose adjusting the initial wall thickness by varying a downstream haul-off speed of the oriented plastic tube, wherein adjusting the initial wall thickness of the extruded tube includes varying an upstream haul-off speed of the extruded tube, but Chapman does disclose that it is possible to achieve direct control over how much axial draw occurs in each zone (page 6, lines 30-32), by adjusting the haul off speeds (page 6, lines 6-9).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have adjusted the initial wall thickness by varying the haul-off speed, since Chapman teaches that there is a direct correlation between the haul off speeds and axial draw (page 6, lines 6-9 and 30-32).

Regarding claim 25, Chapman discloses adjusting an extruded tube initial wall thickness (page 6, lines 5-9) and adjusting an initial extruded tube diameter to alter a diameter of the oriented plastic tube (page 3, lines 36-37).

Regarding claim 26, Chapman teaches diametrically expanding the tube by applying a solid mandrel within a diametrical expansion apparatus (page 5, lines 14-15).

Regarding claim 41, Chapman teaches a continuous process for producing oriented plastic tube, comprising performing a start up sequence, including:

(i) extruding a tube to a start-up diameter selected to facilitate the passage of the tube over a diametrical expansion apparatus during the start-up sequence (page 6, lines 3-5), and (ii) passing the tube over the diametrical expansion apparatus (page 4, lines 30-34); after the start-up

sequence, calibrating the diameter of the extruded tube to an operating diameter which is less than the start-up diameter (page 4, lines 10-16), and performing a continuous operating sequence, including, temperature conditioning (page 3, line 33), diametrically expanding (page 3, lines 36-37), and cooling to produce the oriented plastic tube (page 6, line 4).

Regarding claim 42, Chapman discloses that diametrically expanding the tube includes applying an internal pressure to the tube within an expansion zone at a downstream end of the tube with an expandable plug (page 6, lines 17-20), and limiting and maintaining pressure within the expansion zone with the expandable plug (page 6, lines 35-36),

wherein during performance of the start-up sequence, the expandable plug is in an unexpanded state and the start-up diameter is sufficiently large for allowing the tube to pass over the expandable plug in the unexpanded state (page 6, lines 25-31).

Regarding claim 43, Chapman discloses that calibration of the diameter of the extruded tube to the operating diameter is performed prior to expanding the expandable plug to diametrically expand the tube (page 6, lines 3-5 and lines 16-20), wherein the Examiner interprets that since the tube moves through the sizing sleeve, which it would have been obvious to replace with a variable diameter calibrator (see claim 19), before moving to the expansion zone wherein an expandable plug diametrically expands the tube, that calibration of the diameter of the extruded tube is preformed prior to expanding.

Regarding claim 44, Chapman discloses that diametrically expanding the tube includes applying an internal pressure to the tube within an expansion zone (page 6, lines 24-28).

Regarding claim 45, Chapman discloses limiting internal pressure at a downstream end of the tube with an expandable plug and maintaining pressure within an expansion zone with the expandable plug (page 7, lines 9-12).

Regarding claim 46, Chapman discloses limiting internal pressure at an upstream end of the tube with an upstream plug (page 6, lines 22-24).

Regarding claim 47, Chapman discloses a solid mandrel disposed within a diametrical expansion apparatus is utilized to diametrically expand the tube (page 5, lines 14-15).

7. Claims 27-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapman in view of Ulrich as applied to claims 19-26 and 41-47 above, and further in view of US Patent Application 2002/0022101 (Lenthe hereinafter).

Regarding claim 27 and 32, Chapman teaches that the wall thickness of the extruded plastic tube is a result of velocity of the tube and the haul-off speed (page 4, lines 18- 31).

Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have adjusted the velocity of the tube and the haul-off speed to achieve a desired wall thickness.

Chapman does not teach providing a variable diameter calibrator which is adjustable in diameter and adjusting the diameter of the variable diameter calibrator to a first diameter and to a compensatory diameter different from the first diameter. It is inherent that the initially extruded plastic tube would have an initial extruded diameter.

However, Ulrich, discloses a variable diameter calibrator, which is adjustable in diameter (column 3, lines 46-49).

It would have been obvious for one of ordinary skill in the art at the time of the invention to have substituted the calibrator, disclosed by Chapman, for the variable diameter calibrator, disclosed by Ulrich. The motivation to do so would have been the rationale that by using the variable diameter calibrator, diameter changes can be automatically made without interrupting production (column 3, lines 38-43).

Chapman does not teach that both the first and second modes, which have different diameters and different wall thicknesses, have the same circumferential draw ratio. It is inherent that the initially extruded plastic tube would have an initial extruded wall thickness.

However, Lenthe, in a similar field of endeavor, states that the sum of the stretch ratio in the axial direction and in the circumferential direction is between 4 and 6, preferably between 4.5 and 5.5, particularly preferably being approximately 5 and that the stretch ratio in the axial direction being in a relationship of 3:2 with respect to the stretch ratio in the circumferential direction (paragraph 75). Thus, the circumferential ratio, in the particularly preferable scenario, must remain constant.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have the circumferential draw ratio remain constant, since it provides for an improvement in the manufacture of biaxially oriented plastic tubes (paragraph 2).

Regarding claims 29-31 and claims 37-39, Chapman discloses that the diametrical expansion step comprises application of an internal pressure, specifically an expandable plug with maintains pressure within the expansion zone (page 5, lines 22-24 and Figure 1, element 26), wherein element 20, Figure 1 represents the expansion zone.

Chapman further discloses that the internal pressure is limited at an upstream end by an upstream plug (page 4, lines 10-12), wherein the examiner takes the position that the pushing of the tube tightly onto the upstream plug, a seal is created which maintains the pressure in the expansion zone, thereby the upstream plug limits the internal pressure at the upstream end.

Regarding claim 40, Chapman teaches diametrically expanding the tube by applying a solid mandrel within a diametrical expansion apparatus (page 5, lines 14-15).

Regarding claim 28, Chapman discloses the step of adjusting the extruded tube initial wall thickness, so as to alter the wall thickness of the oriented tube produced by the continuous process (page 4, lines 20-24).

Chapman does not explicitly disclose adjusting the initial wall thickness by varying a downstream haul-off speed of the oriented plastic tube, wherein adjusting the initial wall thickness of the extruded tube includes varying an upstream haul-off speed of the extruded tube, but Chapman does disclose that it is possible to achieve direct control over how much axial draw occurs in each zone (page 6, lines 30-32), by adjusting the haul off speeds (page 6, lines 6-9).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have adjusted the initial wall thickness by varying the haul-off speed, since Chapman teaches that there is a direct correlation between the haul off speeds and axial draw (page 6, lines 6-9 and 30-32).

Regarding claim 33, Chapman discloses the step of adjusting the initial wall thickness of the extruded tube (page 4, lines 20-24).

Regarding claim 34, Chapman discloses a diameter calibrator (page 3, line 29 and Figure 1, element 13), Chapman does not disclose a variable diameter calibrator.

However, Ulrich, discloses a variable diameter calibrator (column 3, lines 46-49).

It would have been obvious for one of ordinary skill in the art at the time of the invention to have substituted the calibrator, disclosed by Chapman, for the variable diameter calibrator, disclosed by Ulrich. The motivation to do so would have been the rationale that by using the variable diameter calibrator, diameter changes can be automatically made without interrupting production (column 3, lines 38-43).

Regarding claim 35, Chapman discloses a downstream tube sizing apparatus (column 4, lines 3-5), but does not explicitly state that the downstream tubing apparatus is replaced to vary the oriented diameter.

Chapman, however, does state that that the forward thrust generated by the tube on the sizing device may be measured by a means and used for process control, as this measurement is very sensitive to variations in the shape of the expansion zone (column 4, lines 61-64).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have replaced the downstream tube sizing apparatus to vary the oriented tube diameter.

Regarding claim 36, Chapman discloses a diametrical expansion plug to diametrically expand the tube and vary the oriented plastic tube diameter (column 3, lines 42-45 and element 26). Chapman does not explicitly disclose replacing the plug.

Chapman, however, does disclose that provided the inflatable plug is inflated sufficiently for the expanding tube to contact the sizing sleeve in either the two modes discussed above, the final outside diameter of the tube will primarily be determined by the sizing sleeve, except for

some minor variations due to "snap-back" or some slight degree of creep between the sizing sleeve and the downstream plug. However, this is minimal (column 4, lines 13-19).

Thus it would have been obvious for one of ordinary skill in the art at the time of the invention to have replaced the plug, since it depends on the sizing sleeve, which is established as being replaceable (see claim 35).

Response to Arguments

1. Applicant's arguments filed 20 January 2010 with regard to claim 19 have been fully considered but they are not persuasive.

The Applicant argues that such variable calibrators are not the variable diameter calibrator of claim 19 as they are not used to control or change the circumferential draw of oriented plastic tube, which requires significantly larger changes in diameter. The Examiner has not identified any teaching, suggestion, or motivation for a person of ordinary skill in the art to use a variable diameter calibrator for controlling or changing the circumferential draw of oriented plastic tube as claimed in claim 19.

The Examiner respectfully disagrees. Claim 19 states that the plastic tube, "has a second tube outside diameter different from the first tube outside diameter," (page 6, claim 19, lines 16-17). Thus, the claim does not include a limitation for significantly larger changes in diameter.

2. Applicant's arguments with respect to claims 20-47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YANA BELYAEV whose telephone number is (571)270-7662. The examiner can normally be reached on M-Th 8:30am - 6pm; F 8:30 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. B./
Examiner, Art Unit 1791

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit 1791